05-GF-113
(2800)

KAUKAUNA UTILITIES

"Community Owned, Customer Driven"

January 29, 2003

Mr. Scot Cullen, Chief Electric Engineer
Public Service Commission
610 N. Whitney Way
P.O. Box 7854
Madison, WI 53707-7854

RE: In the Matter of Filing Reporting Requirements for Appropriate Inspection and Maintenance, PSC Rule 113.0607(6)

Dear Mr. Cullen:

Enclosed for filing are 3 copies of Kaukauna Utility's report to the commission, submitted every two years, showing compliance with its Preventative Maintenance Plan.

Very truly yours,

Eric Miller

Eric Miller
Distribution Engineer

Enclosures

RECEIVED
JAN 31 2003
Electric Division

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TWO YEAR REPORT DOCUMENTING COMPLIANCE WITH THE PREVENTATIVE MAINTENANCE PLAN

Kaukauna Utilities

FILING DEADLINE
FEBRUARY 1, 2003

January 30, 2003

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This report format was prepared by the MEUW work group for PSC Rule 113.0607 for use by the 82 municipal electric utilities in Wisconsin and endorsed by PSC staff as meeting the requirements of Rule PSC 113.0607.

I Reporting Requirements: PSC 113.0607(6) states;

Each utility shall provide a periodic report to the commission showing compliance with its Preventative Maintenance Plan. The report shall include a list of inspected circuits and facilities, the condition of facilities according to established rating criteria, schedules established and success at meeting the established schedules.

II Inspection Schedule and Methods:

SCHEDULE:	MONTHLY	ANNUAL	EVERY 5 YEARS
Transmission (≥69Kv)		X	X
Substations	X	X	
Distribution (OH & UG)			X

METHODS: Five criteria groups will be used to complete the inspection of all facilities.

1. IR – infrared thermography used to find poor electrical connections and/or oil flow problems in equipment.
2. RFI - Radio Frequency Interference, a byproduct of loose hardware and connections, is checked using an AM radio receiver.
3. SI – structural integrity of all supporting hardware including poles, crossarms, insulators, structures, bases, foundations, buildings, etc.
4. Clearance – refers to proper spacing of conductors from other objects, trees and conductors.
5. EC – equipment condition on non-structural components such as circuit breakers, transformers, regulators, reclosers, relays, batteries, capacitors, etc.

Distribution facilities will be inspected by substation circuits on a 5 year cycle such that the entire system will be inspected every 5 years. Inspector instructions for inspecting all facilities and forms are included in the plan.

III Condition Rating Criteria

This criterion, as listed below, establishes the condition of a facility and also determines the repair schedule to correct deficiencies .

0) Good condition
1) Good condition but aging
2) Non-critical maintenance required – normally repair within 12 months
3) Priority maintenance required – normally repair within 90 days
4) Urgent maintenance required – report immediately to the utility and repair normally within 1 week

IV Corrective Action Schedule

The rating criteria as listed above determine the corrective action schedule.

V Record Keeping

All inspection forms and records will be retained for a minimum of 10 years. The inspection form contains all of the required critical information i.e. inspection dates, condition rating, schedule for repair and date of repair completion.

VI Reporting Requirements

A report and summary of this plan's progress will be submitted every two years with the first report due to the Commission by February 1, 2003. The report will consist of a cover letter documenting the percent of inspections achieved compared to the schedule and the percent of maintenance achieved within the scheduled time allowance.

VII Inspected Circuits and Facilities

Circuit # and description	Substation
9122 – Kaukauna Industrial Park	Delanglade
9123 – Hwy J / Rural North	Delanglade
4124 – Rapide Croche Hydro / East Rural	Badger
4125 – Southside 12 kV / East Rural	Badger
8124 – Tie Circuit / Southeast Rural	Ann Street
8123 – South Circuit	Ann Street

Base load and peaking generation, less than 50 megawatts per unit in size, is typically subject to pre-operational checks, in addition to checks and maintenance during and after periods of operation. Kaukauna Utilities owns three portable emergency generators. Two are five kW and the other is an 80 kW unit. All are tested monthly.

VIII Scheduling Goals Established and Success of Meeting the Criteria:

Kaukauna Utilities inspects our substations on a weekly basis. Our six active hydro facilities inspected three times per week (see the attached hydro inspection forms for each unit) and run continuously. Our goal was to continue with these inspections and inspect 40% of the electric distribution system. We expected to complete all required maintenance resulting from the inspections within the prescribed time periods specified in the rating criteria.

We exceeded our goals for distribution inspection, covering around 50% of our system (all of the rural areas that we serve). Six urgent maintenance items were found and repaired within seven days. Of the 140 priority and non-critical maintenance items found, nearly 75 were lack of warning signs (remedied during inspection) with roughly another 20 being mislabeled poles or mapping errors (we are beginning implementation this year of an GIS which will

correct this problem). Of the remaining 45, around 40 were repaired on time. Five items are on an older line scheduled to be rebuilt within the next couple of years. The crew was given instructions to make repairs and hang warning signs as they conducted their inspections. One should note that there was an apparent discrepancy in the way that different line leadmen filled out the paperwork for the inspections. This discrepancy was corrected about half-way through their inspections, but did result in some missed information – at least one of the leadmen placed an 'X' on his inspection form when he noticed an item requiring maintenance instead of placing a rating of zero to four there. Standardization in rating criterion is a goal of ours for the next report, and will no doubt improve as the crew becomes more accustomed to performing these inspections as well.

Circuit 4124 to our Rapide Croche hydro generation facility is now 42 years of age. This line was treated during its lifetime to prolong its longevity, but is nevertheless scheduled to be rebuilt or re-routed within the next three years, pending a proposed 500 MW privately owned power plant going in. Visual inspections of our 34.5 kV Central Substation revealed loose bus work in need of repair while infrared testing found two switches that were heating; these items were repaired within 24 hours of detection.

Kaukauna Utilities conducts annual oil tests on our substation equipment, and does annual infrared inspections on all of our substations and feeders.

IX Facility condition – rating criteria:

Our three diesel generation units are being retired this year. We are working with WPPI to install a new 50 MW gas turbine in their place.

Kaukauna Utilities has three 138 to 34.5 kV substations, six 34.5 to 12.5 kV substations, three and 12.5 to 2400 kV substations used for distribution, with one additional 34.5 to 12.5 kV substation for a paper mill that we serve. A new 34.5 to 12.5 kV substation addition is being installed at our Kaukauna North Substation and will be operational in the first quarter of this year.

Over the last two years, our electric distribution facilities were inspected for all of the rural areas that we serve – roughly 50% of our service area. Our substations were all inspected weekly. We have four 2400 volt circuits that we are scheduling to convert within the next three years, and a number of rear-lot-line pole lines that we are looking at rebuilding as well. Kaukauna Utilities did not experience any major storm related damages within the last year. We recorded 243 outages during the last two years, with 82 being directly attributable to equipment failure.

The line department is upsizing to allow for additional man hours to be spent maintaining / rebuilding our infrastructure, focusing on our conversion work and URD cable replacement while keeping up with the considerable growth that the Fox Valley has been experiencing. The entire utility is improving our construction practices, operational procedures, and even our organizational chart in an effort to afford greater reliability to our customers.

LITTLE CHUTE PLANT INSPECTION REPORT

Date _____

Operator												
Unit #1												
AC Amps												
AC KW												
Temp Windings												
1												
2												
3												
D.C. Amp												
D.C. Volts												
Buss Voltage												
Unit #2												
A.C. Amps												
A.C. KW												
Temp Windings												
1												
2												
3												
D.C. Amps												
D.C. Volts												
Sta Battery Ch.												
D.C. Volts												
D.C. Amps												
#1 Main												
#2 Main												
#3 Main												
Unit #3												
AC Amps												
AC KW												
Temp Windings												
1												
2												
3												
D.C. Amp												
D.C. Volts												
Unit #1												
Lower B. Temp												
Center B. Temp												
Mid B. Temp												
Trust B.Temp												
Ck oil Lowr Guide												
Ck Mid B. Oil Res												
Oil Level Reserve												
Oil Level Mid B.												
Unit Vacuum												
Gate Position												
Blade Angle												
Oil Level Gov.												
Gov. Oil Pres.												
Plant Temp												
Unit #2												
Temp Lower B.												
Temp Center B.												
Temp Mid B.												
Temp Trust B.												

Oil Flow Low B.												
Oil Level Res. T.												
Oil Level Mid B.												
Unit Vacuum												
Gate Position												
Blade Angle												
Oil Level Gov.												
Oil Pressure Gov.												
Plant Air Comp.												
Relieve Air Comp.												
Unit #3												
Temp Lower B.												
Temp Center B.												
Temp Mid B.												
Temp Trust B.												
Oil Flow Lower B.												
Oil Level Res.												
Oil Level Mid B.												
Unit Vacuum												
Gate Position												
Blade Angle												
Oil Level Gov.												
Oil Pressure Gov.												
Unit #1												
Ck Mid B. Oil Lev												
Bleed Oil Head #1												
Check # Brushes												
Unit #2												
Ck Oil Lev Mid B.												
Check Brushes												
Unit #3												
Ck Oil Lev Mid B.												
Check Brushes												
Check Batteries												
Check Boards Dam												
Check Racks												
Ck Wtr Lev Air Comp												
Turn Off Pit Lights												

COMMENTS:

BADGER PLANT INSPECTION REPORT

Date												
Operator												
Unit #3												
Gate Setting												
DC Amp												
Oil Lev End B.												
Oil Temp End B.												
Oil Lev Cntr B.												
Oil Temp Cntr B.												
Oil Temp Trust B.												
Oil Lev Trust B.												
Packing Box Leak												
Unit #4												
Packing Box Leak												
Oil Temp Trust B.												
Oil Lev Trust B.												
DC Amps												
Oil Lev End B.												
Oil Temp End B.												
Oil Temp Cntr B.												
Oil Lev Cntr B.												
Gate Position												
Unit #2 N.B.												
Trust Bear Temb												
Oil Mid-Centr B.												
Oil Lev Mid B.												
Ck lwr B. & pit												
Unit #1												
Temp Trust B.												
Oil Mid-Centr B.												
Oil Lev Center B.												
Ck lwr B. & pit												
Water Disc 1 & 2												
Oil Lev Gov.												
Oil Press Gov.												
Oil Leak Gov. Pa												
Gate Setting												
Air Comp PSI												
Voltage Phase												
1												
2												
3												
Unit #1												
AC Amps												
KW												
AC Volts												
DC Volts												
DC Amps												
R.P.M.												
Unit #2												
Oil Lev Gov												
Oil Press Gov												
Oil Leak Gov Pa												
AC Amps												
KW												
AC Volts												
DC Volts												
Blade Angle												

Gate Position												
Unit #3												
AC Amp												
KW												
AC Volts												
Unit #4												
AC Amps												
KW												
AC Volts												
Sta Batt Chrg												
DC Volts												
DC Amps												
Basement												
Ck Batteries												
Water Pressure												
City												
River												
Upstairs												
Ck Brushes 1 & 2												
Lockouts 1,2,3,&4												
Static Exciter #2												
DC Amp												
DC Volt												
Ck Brushes 3 & 4												

Check Oil Slinges on Bearing Units 3 & 4

Check 3 & 4 Flume Wall - Sluice - Drain Doors - Drop Gates

Turn off lights
Check Racks old & new
*Check Boards Kaukauna Dam
*Bubble Machine - Head Gates

COMMENTS:

KAUKAUNA CITY PLANT INSPECTION REPORT

Date												
Operator												
Ck Batteries												
Batter Chrg												
Volts												
Amps												
Plant Temp												
Air Comp												
#1 Gov oil lev												
#1 Gov pressur												
Turbine #1												
Gen Field Vlt												
Gen Field Amp												
AC Volts												
AC KW												
AC Vars												
AC Amps												
Temp Windings												
1												
2												
3												
Temp Bearings												
1												
2												
3												
4												
Gate Position												
Blade Position												
Turbine Mode												
Turbine #2												
Gate Position												
Blade Position												
Turbine Mode												
AC Volts												
AC KW												
AC Vars												
AC Amps												
Bearing Temps												
1												
2												
3												
4												
Winding Temps												
2												
4												
6												
Gen Field Volt												
Gen Field Amp												
Gov Oil Press												
Gov Oil Level												
Lwr Bear oil												
Oil Lev Center												
#2 Water Press												
#1 Lwr Bear Oil												
#1 Mid B. Oil Gau												
Ck Mid B. Res												
#1 Water Press												
#1 Bleed oil Hd												

#1 CK Brushes											
#2 Bleed Oil Hd											
#2 Ck Brushes											
Ck Sumps #1 & #2											
Check Racks											

Turn off pit lights

Check Screens (Ventilation)

Check Water Guage Air Compressor

Check Tainter Gate Heaters

COMMENTS:

RAPIDE CROCHE PLANT INSPECTION REPORT

Date												
Operator												
Unit #1												
KW												
K Var Flow												
Adjusted to:												
DC Amps												
AC Volts												
AC Amps												
Trust Temp												
Center Temp												
Ck Brushes												
Ck Trust Oil												
Unit #2												
KW												
K Vars												
Adjusted to:												
DC Amps												
AC Volts												
AC Amps												
Trust Temp												
Ck Brushes												
Ck Trust Oil												
Plant Temp												
Unit #3												
KW												
K Vars												
Adjusted to:												
DC Amps												
AC Volts												
AC Amps												
Trust Temp												
Center Temp												
Ck Brushes												
Ck Trust Oil												
Annunciator Pn												
AC Amps												
KW												
AC Volts												
Power Fact												
Lights												
Unit #4												
KW												
K Vars												
Adjusted to:												
DC Amps												
AC Volts												
AC Amps												
Trust Temp												
Center Temp												
Ck Brushes												
Ck Oil Trust												
Ck lights												
Main Breaker												
Basement												
Ck Batteries												
Battery Charg												
DC Volts												

DC Amps												
Ck Cooling												
Water #3 & #4												
Unit #4												
Gov Pressure												
Gov Mot Oil B.												
Gov Oil Level												
Gate Setting												
Lowr Bear Temp												
Oil Lev Lower												
Oil Lev Mid B												
Mid Bear Temp												
Ck Piston Leak												
#2 Water Pump												
Unit #3												
Gov Oil Press												
Gov Oil Level												
Gate Setting												
Lowr Bear Temp												
Lowr B. Oil Le												
Mid B Oil Lev												
Mid B. Oil Temp												
Piston Leakage												
Air Comp PSI												
Water Line PSI												
Water Disc #2												
Unit #2												
Gov Pressure												
Gov Mot Oil B.												
Gov Oil Level												
Gate Setting												
Oil Lev Lwr B												
Oil Lev Mid B												
Poston Leakage												
#1 Wtr Pump PSI												
#1 Water Disc												
Gov Mot Oil B.												
Gov Oil Press												
Gov Oil Level												
Gate Setting												
Lower B. Temp												
Oil Lev Lower B												
Mid B. Oil Lev												
Mid B. Temp												
Piston Leakage												
Clean Wtr Strain												

Turn Off Overhead & Pit Lights

Ck Dam Boards

Ck Racks

COMMENTS:

Unit's Gate & Blade Changes

#1 Date

#2 Date

#3 Date

#4 Date

HYDCLP2

COMBINED LOCKS PLANT INSPECTION REPORT (PAGE #1)

UNIT #_____

MONTH/YEAR_____

UNI. NO. 1

DATE:

OPER. INITIALS

MAIN PANAL

PANALARM PANAL LIT (CONTROL S/W)

WICKET GATE POSITION

BLADE POSITION

TURBINE SPEED

GENERATOR WINDING TEMPERATURES 1

2

3

4

5

6

OUTBOARD BEARING TEMPERATURE 7

COUPLING END BEARING TEMP. 8

OIL HEAD TEMPERATURE

TURBINE GUIDE BEARING TEMP.

PACKING BOX TEMPERATURE

SPEED INCREASER THRUST BRG. TEMP.

SPEED INCREASER GUIDE BRG.TEMP.

HEAD LEVEL SET POINT

STATUS LIGHTS

COOLING WATER FLOW NORMAL

BREAK ON/OFF

BLADE AT START POSITION

WICKET GATE CLOSED

TURBIBE SHAFT LOCKED

GENERATOR CIRCUIT BREAKER CLOSED

HPU PRESSURE NORMAL

OPERATING POSITION

AC AMPMETER

WATTMETER

POWER FACTOR

DC AMPMETER

AC VOLTMETER

ELAPSED TIME METER

DC VOLTS

INVERTER A.C. VOLTS

INVERTER A.C. AMPS

WATTHOUR METER kwh

WATTHOUR METER kvar

SYNCHRONIZING PANAL

PANALARM PANELS LIT

BUS VOLTMETER

BUSS FREQUENCY

LEAD UNIT

NOTES:_____

—UNIT NO. 2—

DATE:

OPER. INITIALS

MAIN PANAL

PANALARM PANAL LIT (CONTROL S/W)

WICKET GATE POSITION

BLADE POSITION

TURBINE SPEED

GENERATOR WINDING TEMPERATURES 1

2

3

4

5

6

OUTBOARD BEARING TEMPERATURE 7

COUPLING END BEARING TEMP. 8

OIL HEAD TEMPERATURE

TURBINE GUIDE BEARING TEMP.

PACKING BOX TEMPERATURE

SPEED INCREASER THRUST BRG. TEMP.

SPEED INCREASER GUIDE BRG.TEMP.

HEAD LEVEL SET POINT

STATUS LIGHTS

COOLING WATER FLOW NORMAL

BREAK ON/OFF

BLADE AT START POSITION

WICKET GATE CLOSED

TURBINE SHAFT LOCKED

GENERATOR CIRCUIT BREAKER CLOSED

H.P.U. PRESSURE NORMAL

OPERATING POSITION

A.C. AMPMETER

WATTMETER

POWER FACTOR

D.C. AMPMETER

A.C. VOLTMETER

ELAPSED TIME METER

D.C. VOLTS

INVERTER A.C. VOLTS

INVERTER A.C. AMPS

WATTHOUR METER kwh

WATTHOUR METER kvar

M.C.C. SWITCH POSITIONS

WATER LEVEL UNIT #1 DRAFT TUBE

DRAINAGE PUMPS-TIME METER DR#1

A.

B.

DEWATERING PUMPS-TIME METER DW#1

NOTES: _____

HYDCLP4

COMBINED LOCKS PLANT INSPECTION REPORT (PAGE 3 CONTINUED) UNIT #_____ MONTH/YEAR_____/_____

——UNIT NO. 1——

DATE:

OPER. INITIALS

PACKING BOX WATER FLOW7-80W-1

GENERATOR

COUPLING END OIL FLOW 15-80Q-1

OUTBOARD BEARING OIL FLOW 15-80Q-2

OUTBOARD BEARING TEMP.19-38MET-1

COOLING WATER FLOW 15-80W-1

(FLOW ADJUSTED TO)

COOLING WATER TEMPERATURE 15-TIG-1

LUBE OIL PRESSURE 15-IG-1

LUBE OIL TANK LEVEL

LUBE OIL PUMP MOTOR TEMP. 15-88Q-1

LUBE OIL TEMPERATURE 15-38Q-1

LUBE OIL FILTER CONDITION 15-IG-2

COUPLING END BRG. TEMP. 11-38MET-1

SPEED INCREASER

COOLING WATER TEMPERATURE 29-TIG-1

COOLING WATER FLOW 29-80W-1

(FLOW ADJUSTED TO)

LUBE OIL PRESSURE 29-IG-2

OIL-LEVEL IN SPEED INCREASER

LUBE OIL FLOW 29-80Q-1

OIL TEMP.FROM HEAT EXCH. 29-TIG-2

PRESSURE AT INLET TO S.I. 29-IG-3

LUBE OIL TEMP. S.I. SUMP 29-TIG-3

LUBE OIL MOTOR 29-88Q-1

LUBE OIL CONTROL PANAL SICP-1

OIL PRESS. FROM GEAR PUMP 29-IG-1

UNIT #1 PACKING BOX DISCHARGE

CONDITION OF GUTTERS (CLEAN/DIRTY)

COOLING SEAL WATER

4" STRAINER MOTOR TEMPERATURE

(BACKWASH CONDITION)

(STRAINER FLUSHED)

OPERATING BOOSTER PUMPS

BOOSTER PUMP MOTOR TEMPERATURE

DISCHARGE HEADER PRESSURE 20-P-1

M2 PUMP DISCHARGE PRESSURE 20-P-2

M1 PUMP DISCHARGE PRESSURE 20-P-3

D.C. PUMP DISCHARGE PRESSURE 20-P-4

2" STRAINER MOTOR TEMP. 20-S-1

(BACKWASH CONDITION)

(STRAINER FLUSHED)

2" STRNR. DIFFER. PRESS. 20-63W-1

BASKET STRAINER (CLEANED) 20-F-1

PLANT COOLING WATER FLOW 20-ICW-1

——UNIT NO. 2—— DATE:

OPER. INITIALS

STATION SERVICE

STATION SERVICE AMPMETER

STATION SERVICE VOLTMETER

STATION SERVICE kwh

STATION SERVICE TRANSFORMER TEMP.

D.C. CHARGER VOLTS

D.C. CHARGER AMPS

OPERATING FLOOR TEMPERATURE

EXHAUST FAN STATUS EF1

EXHAUST FAN STATUS EF2

EF1 THERMOSTAT SETTING (RESET TO)

EF2 THERMOSTAT SETTING (RESET TO)

INTAKE GATE MAIN CONTROL PANAL

STATUS OF INDICATING LIGHTS

(UNIT #1 OPEN)

(UNIT #1 CLOSE)

(UNIT #2 OPEN)

(UNIT #2 CLOSE)

WATER LEVEL D/S TRASHRACKS UNIT #1

WATER LEVEL D/S TRASHRACKS UNIT #2

SEAL WATER FLOW BESTOBELL 5-80-1(2)

SEAL WATER FLOW BESTOBELL 5-80-1(1)

CONDITION OF POWER HOUSE FLOORS

FIRE & INTRUSION ALARM PANAL (ON)

(OTHER LIGHTS)

OIL HEAD TANK LEVEL UNIT #1

OIL HEAD TANK LEVEL UNIT #2

INTAKE GATE REMOTE CONTROL PANAL

STATUS OF INDICATING LIGHTS

(UNIT #1 OPEN)

(UNIT #1 CLOSE)

(UNIT #2 OPEN)

(UNIT #2 CLOSE)

UNIT #1 INTAKE GATE (DOGGED OPEN)

(CLOSED)

UNIT #2 INTAKE GATE (DOGGED OPEN)

(CLOSED)

TRASHRACK CLEANER CONTROL PANAL

STATUS OF INDICATING LIGHTS

(UNIT #1 OPERATING MODE)

(UNIT #1 ICE AUTOMATIC)

(UNIT #2 OPERATING MODE)

(UNIT #2 ICE AUTOMATIC)

TRASH CONVEYOR

TROUGH HEATER

NOTES: _____

—UNIT NO. 2— DATE:

OPER. INITIALS

CONDITION OF GUTTERS (CLEAN/DIRTY)
GENERATOR
COUPLING END OIL FLOW 15-80Q-1
OUTBOARD BEARING OIL FLOW 15-80Q-2
OUTBOARD BEARING TEMP.19-38MET-1
COOLING WATER FLOW 15-80W-1
(FLOW ADJUSTED TO)
COOLING WATER TEMPERATURE 15-TIG-1
LUBE OIL PRESSURE 15-IG-1
LUBE OIL TANK LEVEL
LUBE OIL PUMP MOTOR 15-88Q-1
LUBE OIL TEMPERATURE 15-38Q-1
LUBE OIL FILTER CONDITION 15-IG-2
COUPLING END BRG. TEMP. 11-38MET-1
SPEED INCREASER
COOLING WATER TEMPERATURE 29-TIG-1
COOLING WATER FLOW 29-80W-1
(FLOW ADJUSTED TO)
LUBE OIL PRESSURE 29-IG-2
OIL LEVEL IN SPEED INCREASER
LUBE OIL FLOW 29-80Q-1
OIL TEMP.FROM HEAT EXCH. 29-TIG-2
PRESSURE AT INLET TO S.I. 29-IG-3
LUBE OIL TEMP. S.I. SUMP 29-TIG-3
LUBE OIL PUMP MOTOR TEMP. 29-88Q-1
LUBE OIL CONTROL PANAL SICP-1
OIL PRESS. FROM GEAR PUMP 29-IG-1
PACKING BOX WATER FLOW 7-80W-1
(FLOW ADJUSTED TO)
STATION SUMP WATER LEVEL
(BOT 1.MID 2&TOP 3RD FLOAT)
GENERATOR ROOM TEMPERATURE
HYDRAULIC POWER UNIT
HYDRAULIC OIL PRESSURE 2-IG-1(U1)
HYDRAULIC OIL PRESSURE 2-IG-1(U2)
FLOW FROM UNIT #2 SHAFT SEAL
LAG PUMP MOTOR TEMPERATURE 2-88Q-2
#2 LEAD PUMP MOTOR TEMP. 2-88Q-1
#1 LEAD PUMP MOTOR TEMP. 2-88Q-3
OIL FILTER CONDITION 2-F-4(U1)
OIL FILTER CONDITION 2-F-5(U1)
OIL FILTER CONDITION 2-F-5(U2)
OIL FILTER CONDITION 2-F-4(U2)
SUMP OIL LEVEL
SUMP OIL TEMPERATURE
CONDITION OF GUTTERS (CLEAN/DIRTY)
FLOW FROM UNIT #1 SHAFT SEAL